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**RESPONSE TO OHIO EPA COMMENTS ON, AND
AN ADDENDUM TO, THE OPERABLE UNIT (OU)
1 TREATABILITY STUDY WORK PLAN**

XX/XX/XX



Department of Energy

Fernald Environmental Management Project

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DOE-651-92

Mr. James A. Saric, Remedial Project Director
U. S. Environmental Protection Agency
Region V - 5HR-12
230 South Dearborn Street
Chicago, Illinois 60604

Mr. Graham E. Mitchell, DOE Coordinator
Ohio Environmental Protection Agency
40 South Main Street
Dayton, Ohio 45402-2086

Dear Mr. Saric and Mr. Mitchell:

RESPONSE TO OHIO EPA COMMENTS ON, AND AN ADDENDUM TO, THE OPERABLE UNIT (OU) 1 TREATABILITY STUDY WORK PLAN

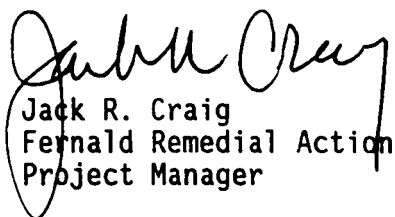
Enclosed are comment responses and an addendum to the OU 1 Treatability Study Work Plan.

These responses identify several analytical procedures which would be accomplished during an optional phase of the Treatability Study. A decision on the initiation and contents of an optional phase of testing has not been made at this time in the process. After completion of the advanced stages of the Treatability Study, a work plan addendum will be compiled identifying any required additional testing and a schedule for completion of the work will be provided to the U.S. EPA and Ohio EPA for review. At that time, decisions can be made as to what information will be available for Feasibility Study, which contractors will be involved in conducting the test and any impacts which could be expected. Additionally, this provides enough time for the design contractors to identify any information gaps which require additional evaluation for remedial design. The tentative schedule date for the decision on the optional phase of the study is March 16, 1993.

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If you or your staff have any questions concerning these responses or the addendum, please contact Oba Vincent at FTS 774-6937 or (513) 738-6937.

Sincerely,


Jack R. Craig
Fernald Remedial Action
Project Manager

FO:Vincent

Enclosures: As Stated

cc w/encls.:

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**RESPONSE TO OHIO EPA COMMENTS
RECEIVED ON THE OPERABLE UNIT 1
DRAFT TREATABILITY STUDY WORK PLAN
DOCUMENT DATE - OCTOBER 10, 1991
OHIO EPA COMMENTS - NOVEMBER 8, 1991**

JANUARY 3, 1992

OHIO EPA COMMENTS ON:
DRAFT TREATABILITY STUDY WORK PLAN FOR OPERABLE UNIT 1
OCTOBER 1991

General Comments

Commenting Organization: OEPA	Commentor:	
Pg.# Section #	Paragraph #	Sentence.Line #
Original, General Comment #1		

Comment: DOE should consider incorporating some mechanisms for quantifying the radon emission which occurred during the treatment options. This information would be directly related to the evaluation of short-term effectiveness for the remedial alternatives. See Ohio EPA General Comment #4 (8/29/91).

Response: It would be more appropriate to conduct this type of test during the Remedial Design Phase when pilot scale testing will be conducted using vendor specific process equipment. The larger scale test will provide for a more representative study of the treatment process whereby detailed engineering evaluations can be conducted and radon emissions and radon removal efficiency rates can be determined for specific vapor and off-gas collection systems. The radon emission measurement during processing is not critical to the FS evaluation of short term effectiveness. The FS evaluation of alternatives assumes that any alternative that involves waste treatment will include an off-gas collection and treatment system for radon and other constituents. The total cost of an off-gas collection system that would be designed for either cement stabilization or vitrification based alternatives would be expected to be approximately the same. Any cost difference between the two systems is expected to be within the +50, -30 percent cost envelope required in the FS. The equipment cost for the off-gas collection and treatment system is a relatively small percentage of the overall remediation cost. DOE does, however, plan to conduct measurements of radon from the treated waste in the optional phase testing. This data can then be compared to radon measurements of the untreated waste for comparison of treatment efficiency.

Action: None required.

Commenting Organization: OEPA	Commentor:	
Pg. # Section #	Paragraph #	Sentence/Line #
Original, General Comment #2		

Comment: Durability tests should be run during the advanced phase testing for the stabilization of untreated material. The following is the justification for these tests:

A) Through failure mechanisms such as: desiccation cracks, slope instability, settlement, piping, penetration, erosion, cold climate, earthquakes, and construction errors, water can permeate through the facility. Therefore the waste can become saturated, causing the stabilized waste to erode and possibly contaminate the surrounding area. Therefore, to determine what waste matrix is the most durable (erosion resistant), a wetting and drying test is needed.

B) This radioactive waste has a life expectancy of over 1000 years. There is no data available on the structural longevity of the low level radioactive waste facility. Since this remediation is to be a permanent solution, durability test would provide data to help choose the most durable solidified waste matrix.

C) Radioactive waste will emit heat radiation as it decays. Proper venting of the stabilized waste will allow the waste to be cooled off, therefore, a change in temperature will occur. With this change in temperature an additional source for degradation is encountered. A freezing and thawing test would provide data on the most durable form.

D) From the technical document: Stabilization/Solidification of CERCLA and RCRA Wastes; Physical Tests, Chemical Testing Procedures, Technology Screening, and Field Activities (EPA/625/6-89/02). In section 4, Physical Tests to Characterize Waste Before and After Stabilization/Solidification, recommends the use of five plant tests: index property, density, permeability, strength and **durability** tests. Durability tests are the following 1) Freezing and Thawing Test of Solid Waste (ASTM D4842); 2) Wetting and Drying Tests of Solid Wastes (ASTM D4843).

Response: DOE agrees that there may be technical value in performing durability tests on the cement stabilized waste. There is not, however, adequate justification for performing the durability tests on the vitrified waste at this stage of the RI/FS process. The rationale for not conducting durability tests on vitrified waste is as follows:

- The US EPA, through an exhaustive research program has already established (Federal Register Vol.55, No. 106, Friday, June 1, 1990; Rules and Regulations; III A.8.C.) that vitrification is the Best Demonstrated Technology (BDAT) for high level waste. DOE feels that it would be inappropriate to require performance testing for a low level waste that are more stringent than for disposal of a high level waste.
- The existing work plan contains plans to conduct a more appropriate durability test on the vitrified glass. The Nuclear Waste Glass Product Consistency Test (PCT) will be conducted on the vitrified waste. The PCT, which was submitted to ASTM subcommittee C26.13 (Repository Waste Package Materials Testing) in January 1990, is designed to:

- evaluate the chemical durability of glass;
 - evaluate the radionuclide release properties of nuclear waste glass; and
 - evaluate whether the glass durability or radionuclide release properties have been consistently controlled during long term production.
- The PCT is a "worst case" durability test since it requires crushing the glass to 100-200 mesh size. The ASTM Wetting Drying Test required by OEPA (ASTM: D4843-88) is designed for "wetting and drying resistance of monolithic solid, solidified/stabilized waste". Crushing the glass in the PCT more closely reflects waste degradation that could occur than simply testing a monolithic sample for mass change. The PCT also reflects a more worst case scenario than the freezing/thawing test since glass is a natural insulator and is not as sensitive to thermal expansion as other materials such as cement. Crushing the glass already simulates the weathering cycle, and therefore whether the glass cracks or not will have no deleterious effect on the concentration of contaminants in the leachate.
 - The PCT is a specialized test procedure that was developed specifically to evaluate vitrified waste. As such it takes into consideration waste characteristics and properties of glass that other test methods may not accurately measure.

In regards to the cement stabilized waste, DOE would agree to implement durability testing (ASTM Methods D4842 and D4843) under the following provisions:

1. The durability testing would have to be conducted under the optional phase of testing. The OU-1 Treatability Testing Program is on the critical path of the RI/FS Consent Agreement schedule and the addition of durability testing in the advanced phase of testing as proposed in the OEPA comment would result in a schedule delay and extension of the OU-1 ROD date. The option phase of testing is not on the critical path for the OU-1 schedule.
2. Conducting the durability test during the optional study phase will mean that although the test data will be available for inclusion in the Feasibility Study/Proposed Plan there may not be adequate time to fully evaluate and interpret the data in the body of the report. The optional treatability studies run concurrently with preparation of the FS/PP and conclude during and internal review cycle for the draft FS/PP. DOE will attempt to the extent possible to fully incorporate the durability data into all phases of the FS/PP but given the schedule constraints it cannot be guaranteed.

3. The RI/FS Consent Agreement schedule contains a decision point following the advanced phase of treatability testing where the data is evaluated and a decision is made as to whether optional testing is required. DOE would like to retain this decision point as a reevaluation period to ensure that once all the advance phase data has been evaluated that the durability test are still justified. At such time a determination will be made as to which and how many samples are appropriate for durability testing. DOE would then submit a Work Plan Addendum to US EPA and OEPA that would include a description of the testing program along with methods and procedures to be used. Any decisions regarding durability testing will then be made jointly with the US EPA and OEPA.
4. DOE would like the concurrence of the US EPA on this approach and would like to receive a written acknowledgement from OEPA prior to proceeding.

Action: See comment.

Specific Comments

Commenting Organization: OEPA	Commentor:	
Pg. #18 Section #1.2.4	Paragraph #	Sentence/Line # Figure 1-3, 1-2
Original, Specific Comment #1		

Comment: In addition to MCLs as Remedial Action Objectives, non-zero MCLGs should be included. The NCPs support of MCLs has been previously emphasized by Ohio EPA in our comments on a number of documents.

Response: Although we will make the change as requested by Ohio EPA, only non-carcinogens have non-zero MCLGs. Furthermore, with the exception of three compounds (all in the Aldicarb family), the value of the MCLG is equal to the MCLa for all noncarcinogens. Therefore, inclusion of "non-zero MCLGs" does not change the Remedial Action Objectives for Operable Unit 1.

Action: Figure 1-3 has been revised and is included in the attached addendum. The revised Figure 1-3 is to replace Figure 1-3 in the October 1991 Treatability Study Work Plan For Operable Unit 1.

Commenting Organization: OEPA	Commentor:	
Pg. #20 Section #1.2.4	Paragraph #	Sentence/Line # Figure 1-3, 6
Original, Specific Comment #2		

Comment: Incorporate non-zero MCLGs as ARARS. See previous comment.

Response: See response to specific comment 1.

Action: See action to specific comment 1.

Commenting Organization: OEPA	Commentor:	
Pg. #32 Section #1.4.4	Paragraph #	Sentence/Line #19
Original, Specific Comment #3		

Comment: Short-term effectiveness could also be influenced by the amount of radon and organic vapors off-gassing during the various treatment options. See General Comment #1 above and previous General Comment #4b (8//29/91).

Response: This type of test needs to be implemented during the Remedial Design Phase when pilot scale testing will be conducted using vendor specific process equipment. The larger scale test will provide for a more representative study of the treatment process whereby detailed engineering evaluations can be conducted on specific vapor and off-gas collection system.

Action: None

Commenting Organization: OEPA	Commentor:	
Pg. #7 Section #3	Paragraph #	Sentence/Line # Table 3-3
Original, Specific Comment #4		

Comment: The table fails to include organic contaminants in water. Due to the presence of known organic contamination in the waste and groundwater near the waste pits, this table must include organic contaminants as in Table 3-2.

Response: Concur.

Action: Table 3-3 has been revised to include organic contaminants in water and is included in the attached addendum. The revised Table 3-3 is to replace Table 3-3 in the October 1991 Treatability Study Work Plan For Operable Unit 1.

Commenting Organization: OEPA	Commentor:	
Pg. #6 Section #4.1.3	Paragraph #	Sentence/Line #
Original, Specific Comment #5		

Comment: DOE's response to OEPA General Comment #4b states that radon leachate concentrations will be measured. The Treatability Study Work Plan does not address this analysis. An additional appendices such as that submitted in the Addendum to Operable Unit 4 Treatability Study Work Plan (10/91) should be incorporated.

Response: Radon leach testing will be conducted for both cement stabilization and vitrification during the optional phase of the treatability program if the radium content of the samples is greater than 15 pCi/g. However, DOE will select the samples to be used for leach testing based on the review of the final analysis of the advanced phase testing. The decision of "how many" and "which" samples to use for leach testing will be made during the decision point activity (as prescribed in the RI/FS Consent Agreement Schedule) following the advanced phase of treatability testing.

The attached addendum contains the radon leach testing procedures and is to be included at the end of Appendix C in the October 1991 Treatability Study Work Plan For Operable Unit 1.

Action: See response.

Commenting Organization: OEPA	Commentor:	
Pg. #6 Section #4.1.5	Paragraph #	Sentence.Line #
Original, Specific Comment #6		

Comment: All tests to be performed during the Optional Phase should be submitted to the EPAs for review and approval.

Response: At the conclusion of the Advance Phase of Treatability Testing, DOE will prepare a Treatability Work Plan Addendum for submittal to US EPA and OEPA. The Work Plan Addendum will address Treatability Tests that will be conducted under the Optional Phase of Testing. The Work Plan Addendum will contain the following information:

- Description of tests to be conducted in the Optional phase.
- Description of the number and type of samples to be analyzed.
- Copy of the Test Methods and Procedures to be used in the optional Phase of Testing.
- Schedule for completion of the Tests.

The intent of the Work Plan Addendum is to provide US EPA and OEPA with details on the Optional Phase of Treatability Testing. The submittal of the addendum is not, however, on the current RI/FS Consent Agreement Schedule. Therefore, a formal review/approval cycle is not planned. In order to prevent any unnecessary delays in the schedule DOE would prefer to maintain the addendum as an informal submittal. If, however, US EPA or OEPA prefer to formally review and approve the document, the appropriate review cycle can be added and the Consent Agreement Schedule modified accordingly.

Action: Submit Work Plan Addendum at the conclusion of the Advanced Phase Testing.

Commenting Organization: OEPA	Commentor:	
Pg. # Section #15	Paragraph #	Sentence/Line #
Original, Specific Comment #7		

Comment: The Reference section has been left out of the document. Replace section.

Response: Concur.

Action: The Reference section has been included in the Attached Addendum and is to be included in the October 1991 Treatability Study Work Plan For Operable Unit 1 preceding Appendix A.

Commenting Organization: OEPA	Commentor:	
Pg. # Section #	Paragraph #	Sentence/Line Appendix C,
5-Day Static Leach Test		
Original, Specific Comment #8		

Comment: A) This test does not represent what condition would be expected for waste placed in a disposal facility. Considering this waste disposal facility is to have an extensive life, the waste could go through many saturated cycles. A representative wetting cycle should be longer than 5 days.

B) The use of this test as a screening test is acceptable, if the Measurement of the Leachability of Solidified Low Level Radioactive Waste by Short-Term Procedure (ANSI/ANS-16.1-1986) is used in the advanced phases.

Response: A) The data from the 5-Day Static Leach test is to be used for comparative proposes between samples and to provide leaching information using de-ionized water leachant instead of acetic acid.

Action: None.

Response: B) The ANSI-16.1 test is not required for remedy screening or remedy selection and would be more appropriate during the Designing Phase. If ANSI-16.1 were to be implemented into the Operable Unit 1 Treatability Program at this date there would be adverse impact of the budget and schedule prescribed for Operable Unit 1 Treatability Program. The cost of performing ANSI-16.1 has been estimated at \$800,000. The time required to conduct the test will cause in excess of a six week extension in the current Consent Agreement Schedule. Therefore, the ANSI-16.1 test will not be conducted.

Action: None.